DOCUMENT RESUME

ED 076 144 HE 004 122

AUTHOR Stallings, William M.; And Others
TITLE The University of Illinois Placement and Proficiency System: Description and Results.
INSTITUTION Illinois Univ., Urbana. Office of Instructional Resources.
REPORT NO I-340
PUB DATE May 72
NOTE 18p.

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS Achievement Tests; *Costs; Educational Finance; *Equivalency Tests; Evaluation Techniques; Expenditures; Grade Equivalent Scales; *Higher Education; Placement; Research; *Research Projects; *Student Placement
IDENTIFIERS *University of Illinois

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Research Report

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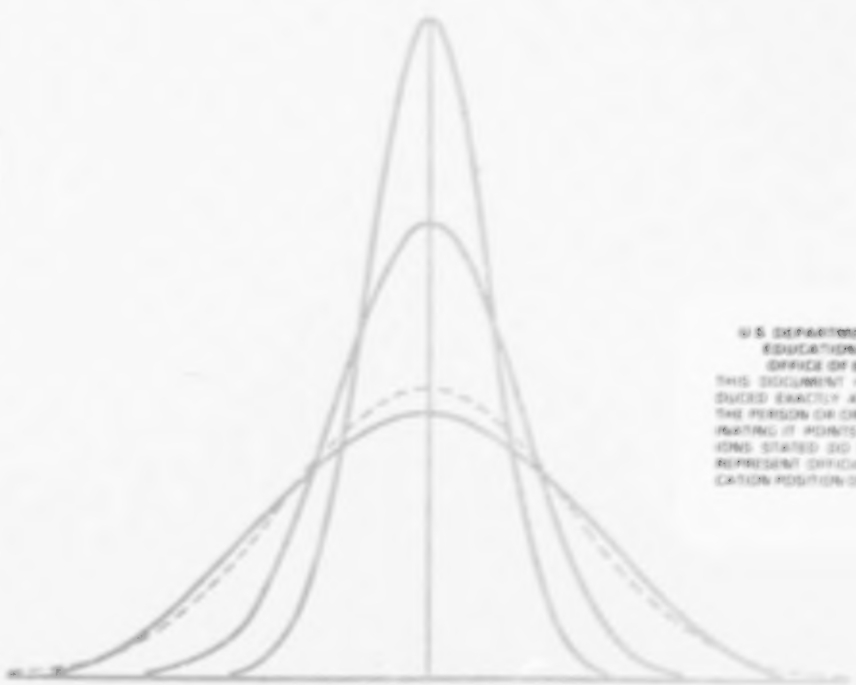
AUTHOR(S)

William M. Stallings, Lawrence M. Aleamoni and D. K. Heil



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REPORT # 340

DATE MAY, 1972

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MEASUREMENT AND RESEARCH DIVISION - OFFICE OF INSTRUCTIONAL RESOURCES
307 ENGINEERING HALL - UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS 61801

ABSTRACT

This report begins with an overview of placement and proficiency testing, with emphasis on the benefits to students and instructors of such testing. Various ways in which proficiency credit may be earned at the University of Illinois are discussed. In particular, the freshmen Placement and Proficiency System is described in detail. Some data are provided as to the extent to which placement and proficiency are utilized by entering University of Illinois freshmen. Costs of administering the Placement and Proficiency System are compared with institutional instructional costs. The paper concludes with a look at the future of placement and proficiency testing at the University of Illinois.

The University of Illinois Placement and Proficiency System: Description and Results[1]

William M. Stallings, Lawrence N. Alemoni, and D.K. Heil

The readers of this report do not need to be reminded that American public colleges and universities are going through a period of hard times. It is also a period in which professorial perquisites (including tenure); hallowed requirements (including foreign languages and physical education); and traditional classroom experiences (as translated into credit hours) are all being called into question by the critics of higher education. In the frenetic search for new ways to make the higher learning more relevant and responsive, an old friend has often been overlooked. Testing. Though often maligned in the past, testing should now be recognized as a way of individualizing instruction and as a "key to a more flexible and innovative educational system" (to quote out of context from the College-Level Examination Program "Fact Sheet"). By testing, we have particular reference to institutional or administrative testing, rather than classroom testing.

In the argot of testing specialists, the granting of credit by examination is termed proficiency. A frequent concomitant of proficiency examinations is placement testing. Technically, placement may be defined as "...the assignment of personnel to different treatments along a single dimension when there is only a single prediction dimension, though this may be a composite derived from a procedure such as multiple regression" (Hills, 1971, p. 701). Placement, therefore, is a way of breaking the educational

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[1] Additional information on the University of Illinois Placement and Proficiency System may be obtained from Lawrence N. Alemoni, 307 Engineering Hall, University of Illinois, Urbana, Illinois 61801

lockstep by assigning students to a cohort which would be relatively homogeneous with respect to achievement in a given area.

What are the putative benefits, both to an institution and to the student, of a placement and proficiency system? Credit by examination (or proficiency) can introduce flexibility into higher education by: (a) permitting students to graduate in less than the traditional four years; (b) allowing students to obtain credit for knowledge acquired outside of college classrooms; (c) providing greater opportunities for students, on their own initiative, to satisfy course and program requirements; (d) affording students the chance to pursue major areas in greater depth, to explore new academic subjects, and perhaps to earn a double degree--all through the "released time" gained by proficiency credit.

Placement in higher education is similar to ability grouping in primary and secondary education. If optimally placed, a student should find his course work challenging, not frustratingly difficult and not absurdly easy. The advantages of placement include: (a) permitting more accurate and realistic course scheduling for the students; (b) promoting good student attitudes toward those courses into which they were placed; (c) enabling students, by more homogeneous grouping, to perform at or near their maximum capability; (d) reducing the instructor's burden by generating relatively homogeneous ability groups; (e) encouraging students to begin advanced work at an earlier period in their academic careers based upon their demonstrated abilities.

The increasing importance of placement and proficiency is well illustrated by a recent foundation document. A report of the Carnegie Commission on Higher Education (1971) has offered as one of its recommendations that "tests should be fully developed and accepted in lieu of college

credit" (p. 13). The report also implies that the implementation of the preceding recommendation may be one way of reducing the time required to earn a bachelor's degree.

So far this discussion has concentrated on the potentially positive aspects of placement and proficiency with respect to the student and the instructor. It is, however, becoming common to assess the impact of any program upon the university in terms of cost-benefits. Unfortunately, published cost-benefit analyses of placement and proficiency systems are, to the writers' knowledge, nonexistent. The complexities of such an analysis are obvious. Students who place in advanced courses or who proficiency required courses may take more advanced work in those areas in which they placed or proficiencied. In most institutions, advanced courses have greater instructional costs than introductory courses. It also may be that students earning proficiency credit tend to graduate earlier or to take fewer total course hours of work. We just do not know. And it is impossible to state, without more data, whether placement and proficiency programs will decrease or increase overall institutional cost. As a start, however, some data comparing proficiency credit costs with instructional costs are presented later in this paper.

The remainder of this article will deal primarily with the locally administered set of tests, which with their analyses, scoring, and dissemination, form the "University of Illinois Placement and Proficiency System." Because placement and proficiency are overlapping functions, often serviced by the same examination, they will be discussed together.

Perhaps this is the appropriate point at which to mention that the placement and proficiency system of the University of Illinois functions

efficiently only because of the close cooperation by several University offices. Those offices include: (a) the Measurement and Research Division of the Office of Instructional Resources; (b) the Psychological and Counselling Center; (c) the Office of Admissions and Records; and (d) the Administrative Data Processing unit.

1. How may Placement and Proficiency Credit be Earned?

There are three ways in which University of Illinois students may earn proficiency credit. First, students who have taken certain college preparatory courses in high school may receive credit by examination on the various Advanced Placement Program (APP) tests. These tests are developed and administered by the Educational Testing Service for the College Entrance Examination Board. There is a fee charged for taking these tests. Second, according to University regulations, a student may petition to be given a proficiency examination, usually a locally developed test, in virtually any undergraduate course. To receive a "pass," the student must perform at least at the "C" level. No official record is made of failures in these examinations, and grades received on proficiency examinations are not considered in computing grade-point averages. Third, entering students are offered without cost the opportunity to earn college credit in freshman rhetoric, biology, and five foreign languages by examination. These examinations consist of both standardized and locally developed tests but all cut-off scores are determined from institutional analyses. In the foreign languages and in one biology examination, proficiency is contingent either upon the number of high school units or upon scores on another, but related, proficiency examination. Placement in more advanced courses also may occur as a consequence of scores on either the Advanced Placement Program

tests or on the locally administered placement and proficiency examinations (i.e., ways one and three enumerated above). Contingencies similar to those for proficiency are used in placement for Latin, biology, chemistry, and mathematics.

2. How does the University of Illinois Placement and Proficiency System Actually Work?

It is difficult to know just where to begin in describing any system. Although part of what follows is somewhat abstract and not particularly rigorous, the description in the next several paragraphs is typical of what has happened at the University of Illinois in setting up mechanisms for granting credit by examination or for differential placement.

Perhaps the first step in establishing a university placement and proficiency system is convincing administrators and faculty of the benefits that such a system would provide. Next, reliable tests must be found--or constructed--which have content as well as potential empirical validity. Once selected, these instruments must be locally validated. One method of validation requires giving the tests in the beginning of a course for which proficiency credit is being considered and by giving them again at the end of the course. Ideally, parallel or equivalent test forms should be used. If the test measures what is being taught and if, on the average, students learn, then there should be a significant gain in performance. Moreover, scores on the post-test should correlate positively with course grades, yielding a second type of validation. When a new student is given the test as a proficiency examination, his being granted credit is contingent upon where he ranks on the distribution of test scores, relative to students who completed the course. As was noted previously, at the University of

Illinois this means performance equal to or better than "C" students. Similarly, placement is also contingent upon a certain level of test performance with respect to other students who completed the course (see Aleamoni and Matsunaga, 1970).

The University of Illinois Placement and Proficiency System might also be analyzed in terms of student data flow. The flow chart in Figure 1 illustrates the salient data processing aspects of the system.

In common with many other universities, application to the University of Illinois requires filling out forms. Both biographical information and standardized test data must be submitted. These data are retained by the Office of Admissions and Records.

Starting in February, the Testing and Scoring Services Office of the Psychological and Counseling Center begins testing in the "field" (i.e., other locations in the state). Only students who have been admitted to the University of Illinois are tested. In the course of a testing day, Kuder Inventory, Cooperative Reading Tests, Cooperative School and College Ability Tests (SCAT), and placement and proficiency examinations (in the areas of English, mathematics, chemistry, biology, French, German, Russian, Spanish, and Latin) are administered. The chemistry and biology examinations were locally developed. All other placement and proficiency examinations are from the College Placement Test series of the Educational Testing Service, which serves as an agent for the College Entrance Examination Board. Of the foreign language examinations only the reading portions are given; the listening examinations are administered when students arrive on campus for advanced enrollment. Incidentally, a more complete descrip-

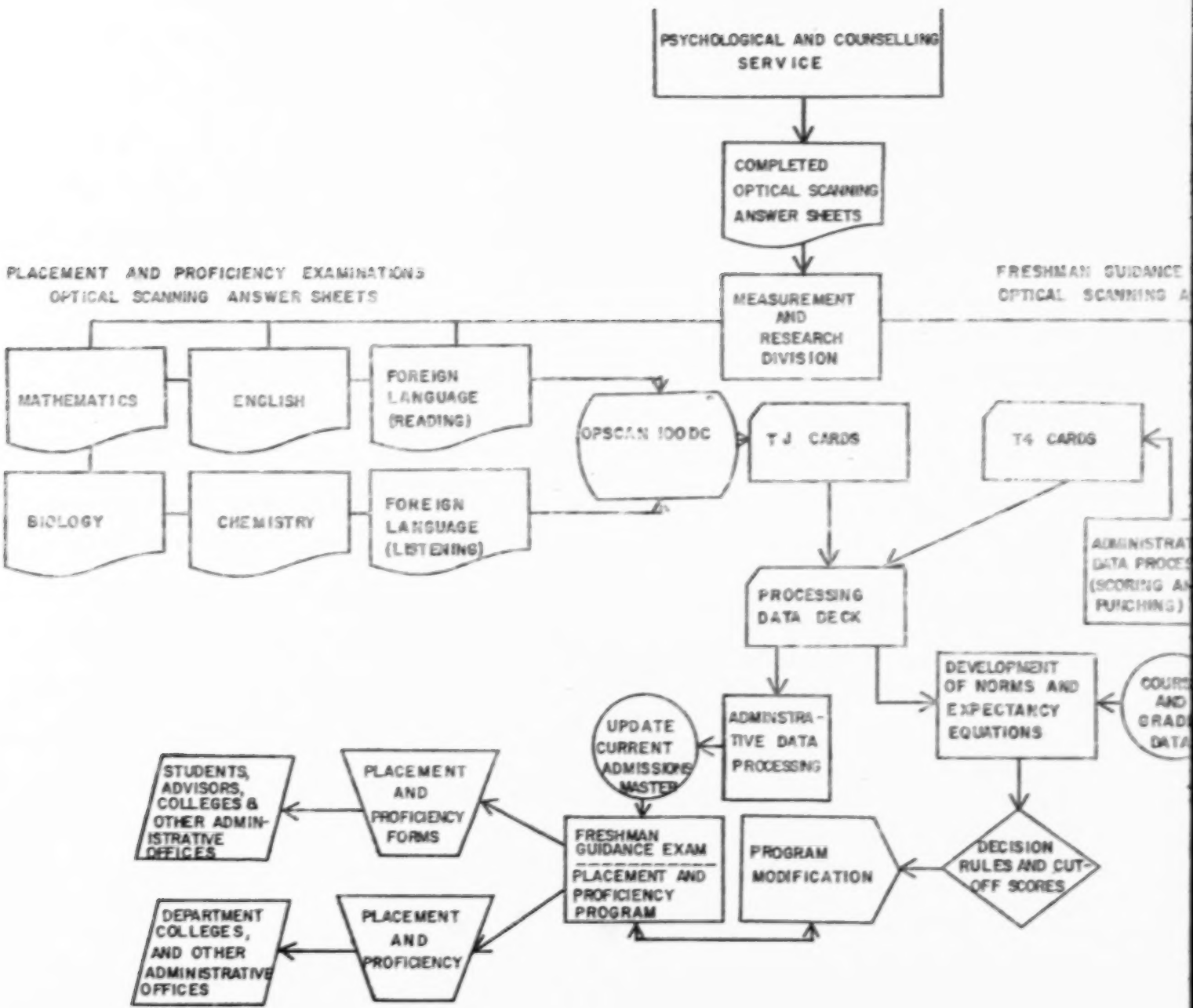
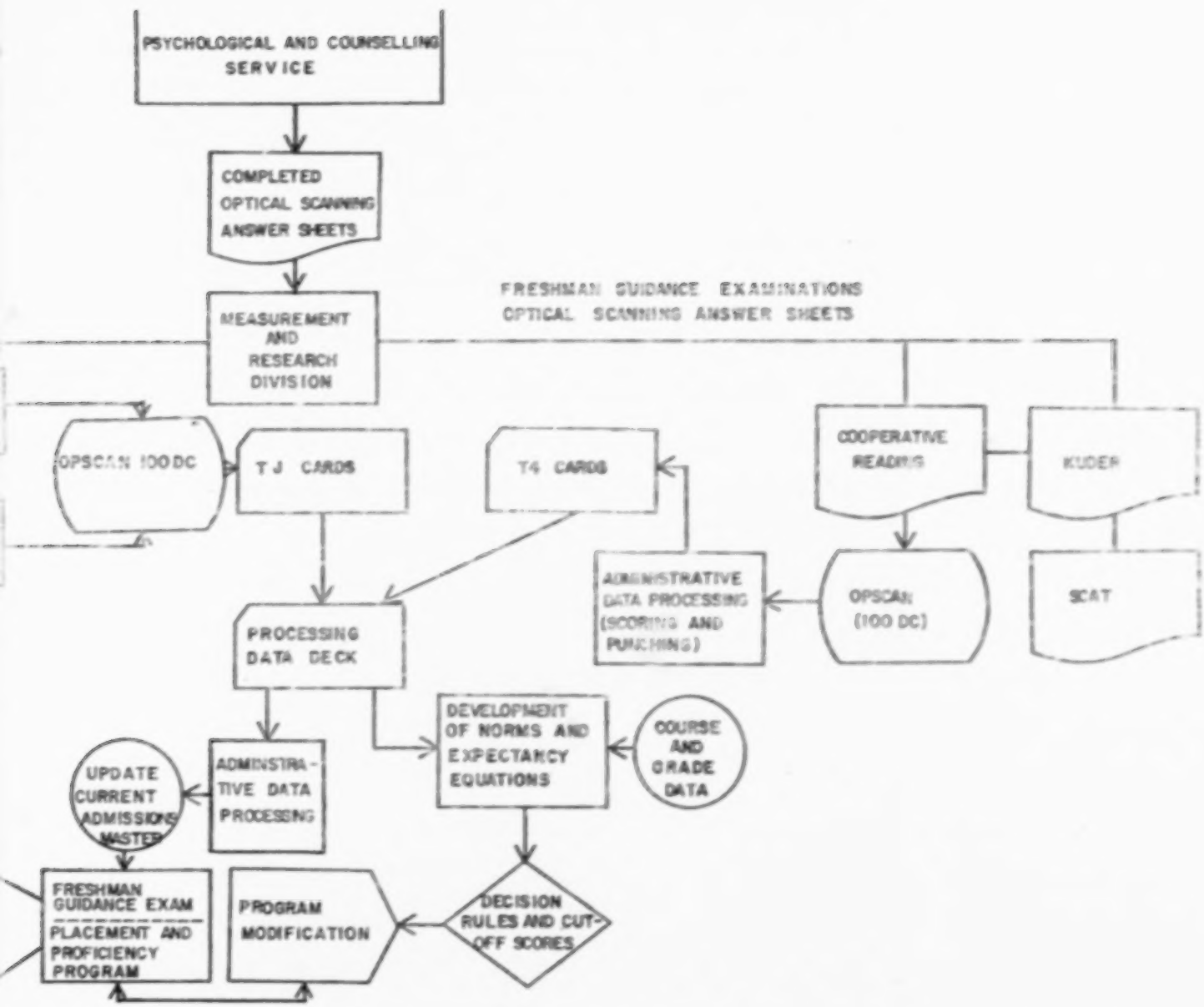


FIG. 1. FLOW CHART OF THE UNIVERSITY OF ILLINOIS FRESHMAN GUIDANCE EXAMINATION AND PL



OF ILLINOIS FRESHMAN GUIDANCE EXAMINATION AND PLACEMENT AND PROFICIENCY SYSTEM.

tion of the foreign language aspect of the University of Illinois Placement and Proficiency System is given in Aleamoni and Spencer (1963).

All tests are administered on Optical Scanning answer sheets. Personnel of the Measurement and Research Division process the answer sheets through an Optical Scanning 100 DC machine, which is an electronic mark reading scanner with an associated card punch. Routinely, all sheets are scored twice to ensure reliability. For the placement and proficiency tests, the output consists of cards containing identification data, responses to questions printed on the answer sheets, test codes, and test scores. Locally, these cards are designated T-J cards. There is one T-J card produced per student per test. Later, if an item analysis is required, then the sheets are reprocessed so as to generate item data on cards. Somewhat differently, for the Kuder, SCAT, and Reading tests, item data (and identification information) are always punched. Scores are generated by an IBM 360/50 with programs maintained by Administrative Data Processing. For each student, the Kuder, SCAT, and Reading Summary data are punched on one card, the T-4 card. When both T-J and T-4 cards have been produced, the data are entered on the master admissions tape, dubbed the "Admissions Master." It should be noted that there are procedures for correcting and updating any individual student's record on the master file. Essentially, these procedures require submitting updated T-J or T-4 cards.

In conjunction with the various cooperating academic departments, various decision rules have been arrived at in the awarding of proficiency credit and the differential placement of students. These decision rules are incorporated into the placement and proficiency program. With a copy of the "Admissions Master" tape as input, the placement and proficiency program generates two documents, the Placement and Proficiency Form and

the Placement and Proficiency List. The Form is primarily for the student and his advisor; the List is essentially an administrative document and is sent to the appropriate department and college. The List contains much of the same information except that up to 14 student records are contained on each sheet.

As can be seen in Figure 2, the Form presents such data as test scores, course placements, and courses proficienciced. Moreover, local normative data, in the form of deciles, are provided to give the student (and his advisor) a realistic appraisal of the student's abilities and interests.

3. How is the University of Illinois Placement and Proficiency System Updated Each Year?

Over time, the pattern of entering students' preparation, abilities, and interest is subject to change. Also, new academic areas may be added to the system. Consequently, certain data (equations, norms, and decision rules) must be generated anew each year. For example, new regression equations for predicting course grades are computed. From a bivariate distribution of predicted course grades and actually earned grades, expectancies of a "C" or better course grade are developed. Also, all measures are renormed by computing new decile equivalents (actually grouping the total score distribution into tenths). Perhaps, the most critical update steps are those of validation. Did students who were granted proficiency credit or advanced placement actually perform at satisfactory levels in their advanced courses? At the University of Illinois, there is some evidence concerning the efficacy of placement and proficiency especially in the foreign languages (see Alcamoni and Matsumaga, 1970). Close liaison with the faculty also ensures that, from a subjective

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FIG. 2. Placement and Proficiency Form.

viewpoint, the system minimizes the number of misplacements. Often, changes are made in cutting-scores. Occasionally, placement and/or proficiency has an administrative component. That is, the use of test score distributions, gained from previous students, allows academic departments to optimally allocate their teaching faculty to various courses.

A unique feature of Illinois' placement and proficiency system is flexibility. During the several years of its existence, many modifications have been made to the system. Output has been expanded, courses or areas added, and changes have been introduced to ensure easier interpretations. In short, the original system, as conceived by the late Professor Richard E. Spencer, has proved to be responsive to student faculty and administrative needs.

4. Results and Their Costs

In these fiscally lean days for higher education, any assessment of an educational product must take into account costs. Recently, at the University of Illinois some cost estimates were generated for the placement and proficiency system. These data, which are summarized in Table 1, are not "official" University cost estimates but they do represent "ball park" figures for a typical year. If institutional policy permitted, it obviously would be possible to recoup a portion of these costs by charging students a nominal amount for taking the tests.

What does the University of Illinois receive in exchange for its outlay? Table 2 presents placement and proficiency data for the 1970-1971 academic year. These data refer only to tests given entering freshmen.

Table 1

A Typical Year's Budget for the University of Illinois' Placement and Proficiency System

Category	Cost (Dollars)
Test Administration (Including Salaries)	
In the "Field" Testing	$ 2,906.22
In Office Testing	5,882.00
Miscellaneous	50.00
SUBTOTAL	$ 8,838.22
Test Processing, Analysis, and Dissemination	
Academic Salaries	$18,462.50
Clerical Salaries (including key punch operators, tabulating machine operators, and statistical clerks)	11,027.20
Other Salaries (including proctors, language laboratory operator, and data runner)	1,443.17
SUBTOTAL	$30,932.87
Data Processing (including computer)	
Forms and Lists	$ 525.00
Tests (ETS) @50¢/booklet plus Return Postage to ETS ($25.51)	5,415.51
Optical Scanning Answer Sheets (25,000 @3¢/sheet	750.00
Computer Time	14,272.46
IBM cards	920.00
Optical Scanning of Placement and Proficiency Sheets (Machine costs)	1,042.49
SUBTOTAL	$22,925.46
GRAND TOTAL	$62,696.55

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Table 2

Number of Placement and Proficiency Examinations

Given for September, 1970, Entering Freshmen

Area	Number	Proficiency
Rhetoric	6,347	2,231 (3 hrs.); 170 (6 hrs.)
Chemistry[1]	2,944	
Intermediate Mathematics[1]	1,240	
Advanced Mathematics[1]	3,966	
Biology (Non-Majors)	205	15 (4 hrs.)
Biology (Majors)	534	0
Latin Reading	150	10 (4 hrs.); 1 (8 hrs.)
French Reading and Listening	673	44 (4 hrs.); 5 (8 hrs.)
German Reading and Listening	353	25 (4 hrs.); 10 (8 hrs.); 5 (16 hrs.)
Russian Reading and Listening	36	3 (4 hrs.); 3 (8 hrs.); 2 (16 hrs.)
Spanish Reading and Listening	459	50 (4 hrs.);13 (8 hrs.); 11 (16 hrs.)
TOTAL	16,907	2,593 (8,845)

[1]Used for placement only.

A rapid computation, using the data in Table 2, will show that in 1970 8,845 proficiency credit hours were earned by some 2,593 freshmen. Since the typical undergraduate course carries three hours of credit, then one could also say that slightly fewer than 3,000 three-credit-hour courses were proficiencied. If the typical cost figures of Table 1 were applied to the data in Table 2, it can be seen that each credit hour earned by proficiency examination costs the University about $7.09. This can be contrasted with an instructional cost of $15.13 per credit hour for lower division undergraduate courses.[2] Again, the reader should be cautioned

[2]By instructional costs is meant direct salary costs only. If indirect salary costs, department research, and departmental overhead are added in, the figure becomes $24.90.

that none of these estimates is to be considered official University of Illinois data.

Two other areas where proficiency credit can be earned were not mentioned in Table 2 but should be included to reflect the full scope of the University of Illinois program. The total number of students receiving credit through the Advanced Placement Program tests for 1970-71 was 3,470. The total number receiving credit on locally developed departmental tests was 2,440. If each student received approximately 3 credit hours of proficiency credit on both the APP and departmental proficiency examinations, then an additional 17,730 proficiency credit hours were earned by University of Illinois students (primarily freshmen) during the 1970-1971 academic year.

There is a deliberate omission in Table 2; nothing about differential placement is reported. In some respects, placement is very much an individual matter. Correctly placing a student who is deficient in basic communication skills into a remedial English course is just as much a "good" as giving another student so-called advanced placement. Correct placement is not always advanced placement. Furthermore, in a cost-benefit analysis, there are benefits--and costs--associated with placement as well as with proficiency. Clearly, the simplistic tacit assumption that all placement and proficiency costs relate to proficiency alone is untenable. Consequently, the $7.09 figure is an overestimate as far as proficiency alone is concerned. Moreover, that figure includes material, in addition to personnel costs.

5. A Look at the Future or Where Do We Go From Here?

In this concluding section, it might be appropriate to comment on how the University of Illinois Placement and Proficiency System is going to respond to the "Challenge of the Seventies" in higher education.

Like many other institutions, the University of Illinois has endorsed (unofficially) the three-year baccalaurate. Obviously, the key to eliminating, in effect, a year of coursework is placement and proficiency testing. At this writing, a proposal is being readied for submission to the Carnegie foundation. Testing is an integral component of that proposal.

Because the process of developing reliable and valid placement and proficiency examinations (with parallel forms) is necessarily slow, much local interest has been shown in the College-Level Examination Program (CLEP) tests--especially the general examinations. Several of the general and subject CLEP tests have been administered on an experimental basis and are being evaluated as potential proficiency and placement measures.

Finally, the continuing needs for test validation and cost analyses are being met. For example, a study is underway to investigate the effect of earning proficiency credit upon graduation rate. Other studies will include: (a) research on the success of students exempted from traditional academic experiences as contrasted with the experiences of similar students who were not exempted; (b) validation of the CLEP general and subject examination for University of Illinois students; and (c) establishing tests that can be used to guide transfer students into appropriate programs of study.

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